

1. A connection controller, comprising:

a network topology cache coupled to receive network topology data of a network;

5 a packing algorithm coupled to receive a requested traffic pattern of a packet, wherein the packing algorithm computes an actual traffic pattern using the network topology data and the requested traffic pattern such that the network operates as a strictly non-interfering network; and

10 a logical network state entity coupled to communicate the actual traffic pattern to a source corresponding to the packet.

2. The connection controller of claim 1, wherein the connection controller calculates a plurality of routing trees for a plurality of InfiniBand switches in the network, wherein the connection controller calculates a plurality of DLIDs and a set of forwarding instructions for each of the plurality of InfiniBand switches, wherein each of the plurality  
15 of DLIDs corresponds to one of the plurality of routing trees and one of a plurality of destinations in the network, and wherein the connection controller populates a forwarding table of each of the plurality of InfiniBand switches with the plurality of DLIDs and the set of forwarding instructions.

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3. The connection controller of claim 1, wherein computing an actual traffic pattern comprises executing a rearrangement algorithm and assigning one of a plurality of DLIDs to the packet such that the network operates as a strictly non-interfering network.

25 4. The connection controller of claim 3, wherein the packet follows a path through at least a portion of a plurality of InfiniBand switches in the network, and wherein each of the portion of the plurality of InfiniBand switches forwards the packet according to the one of the plurality of DLIDs assigned to the packet such that the network operates as a strictly non-interfering network.

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5. The connection controller of claim 4, wherein each of the portion of the plurality of InfiniBand switches looks up the one of the plurality of DLIDs assigned to the packet in a forwarding table at each of the portion of the plurality of InfiniBand switches.

6. The connection controller of claim 4, wherein each of the portion of the plurality of InfiniBand switches forwards the packet in accordance with the one of the plurality of DLIDs assigned to the packet as found in a forwarding table at each the  
5 portion of the plurality of InfiniBand switches.

7. The connection controller of claim 1, wherein the network is a Clos network.

8. A connection controller comprising a computer-readable medium containing  
10 computer instructions for instructing a processor to perform a method of populating a forwarding table, the instructions comprising:

calculating a plurality of routing trees for a plurality of InfiniBand switches in a network;

calculating a plurality of DLIDs and a set of forwarding instructions for each of the  
15 plurality of InfiniBand switches, wherein each of the plurality of DLIDs corresponds to one of the plurality of routing trees and one of a plurality of end nodes; and

populating the forwarding table of each of the plurality of InfiniBand switches in the network with the plurality of DLIDs and the set of forwarding instructions.

20 9. The connection controller of claim 8, wherein the network is a Clos network.

10. The connection controller of claim 8, wherein each of the plurality of end nodes comprises a destination, and wherein the destination is identified by a BaseLID.

25 11. The connection controller of claim 8, wherein calculating the plurality of routing trees comprises for each spine node in the network, calculating a shortest path from the spine node to each of the plurality of end nodes.

30 12. The connection controller of claim 8, wherein each of the plurality of routing trees comprises at least a portion of the plurality of InfiniBand switches and corresponding plurality of links that form a shortest path from one of the plurality of end nodes to a spine node of the network.

13. A connection controller comprising a computer-readable medium containing computer instructions for instructing a processor to perform a method of forwarding a packet, wherein the packet is created at a source and is addressed to a destination within a network, the instructions comprising:

- 5       executing a rearrangement algorithm for the network;  
      assigning one of a plurality of DLIDs to the packet; and  
      the packet following a path through at least a portion of a plurality of InfiniBand switches from the source to the destination, wherein each of the portion of the plurality of InfiniBand switches forward the packet according to the one of the plurality of DLIDs  
10       assigned to the packet.

14. The connection controller of claim 13, wherein the network operates as a strictly non-interfering network.

- 15       15. The connection controller of claim 13, wherein the network is a Clos network.

16. The connection controller of claim 13, wherein the packet following the path comprises looking up the one of the plurality of DLIDs assigned to the packet in a forwarding table at each of the portion of the plurality of InfiniBand switches along the  
20       path from the source to the destination.

17. The connection controller of claim 13, wherein the packet following the path comprises each of the portion of the plurality of InfiniBand switches forwarding the packet in accordance with the one of the plurality of DLIDs assigned to the packet as found in a  
25       forwarding table at each the portion of the plurality of InfiniBand switches.